

A-23

Design of Polarization Analyzer for RIXS

Xuan Gao¹, Diego Casa², and Clement Burns¹

¹Western Michigan University, Kalamazoo MI 49008

²Advanced Photon Source, Argonne National Laboratory, Argonne, IL 60439

Resonant inelastic x-ray scattering (RIXS) is a powerful x-ray scattering technique for the study of complex electronic excitations in correlated electron systems.

The photons scattered by the sample are collected by the instrument and changes of energy, momentum, and polarization can be measured thus characterizing the nature of the excitations. Only the first two are routinely measured by existing instruments due to technical challenges and low count rates. However, the outgoing polarization provides crucial symmetry information about the intermediate states involved. It also can differentiate overlapping spectral features, and greatly reduce the elastic background at same time.

We will present preliminary results with a flat graphite polarization analyzer, as well as calculation and designs for improved optics. The effective polarization factor, effective reflectivity and focusing for different shapes also have been calculated.